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Carbon classified? Unpacking heterogeneous relations inscribed into corporate carbon emissions*

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abstract How does a corporation know it emits carbon? Acquiring such knowledge starts with the classification of environmentally relevant consumption information. This paper visits the corporate location at which this underlying element for their knowledge is assembled to give rise to carbon emissions. Using an actor-network theory (ANT) framework, the aim is to investigate the actors who bring together the elements needed to classify their carbon emission sources and unpack the heterogeneous relations drawn on. Based on an ethnographic study of corporate agents of ecological modernisation over a period of 13 months, this paper provides an exploration of three cases of enacting classification. Drawing on ANT, we problematise the silencing of a range of possible modalities of consumption facts and point to the ontological ethics involved in such performances. In a context of global warming and corporations construing themselves as able and suitable to manage their emissions, and, additionally, given that the construction of carbon emissions has performative consequences, the underlying practices need to be declassified, i.e. opened for public scrutiny. Hence the paper concludes by arguing for a collective engagement with the ontological politics of carbon.

Introduction

Grand theories on greening capitalism like to postulate that corporations are well able to account for their impacts on nature. In contrast, this paper argues that we find 'greening' capitalist enterprises means betrayal and silencing of both contested and non-contested realties of these impacts upon nature. To substantiate this claim, this paper unpacks the underlying classificatory work required for a corporation to establish accounts of their carbon emissions. This argument contributes to the aim of the paper: using actor-network theory (ANT) to analyse how classification as part of actual

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accounting practices constitutes a significant moment in the social construction of carbon emissions. To be specific, this paper uses 'carbon' as shorthand for 'CO_2e', i.e. the accounting equivalent of CO_2 (cf. MacKenzie, 2009a: 443-447; Lippert, 2012). The construction of such emissions may be understood as a specific technology which is often construed as a means for reconciling capitalism with 'nature'. However, such utopian engagements with reality also need to address the manageability of climate change and, thus, carbon. We will conclude that *how carbon comes to matter* is to be understood as 'ontological politics' (Law, 2008).

This story is part of a research project scrutinising the work practices of corporate 'agents of ecological modernisation', i.e. those who are supposed to ecologically modernise organisations.[1] Ecological modernisation refers to a rationality-ideology which supposedly reconciles capitalism with 'nature'. The primary means by which this reconciliation is assumed to take place are with the use of both social and material technologies. Companies are understood as being among the prime actors to render industrialised societies green and sustainable. While ecological modernisation also provides roles for the nation-state, Non-Governmental Organisations and other societal actors, the notion that companies – and through this capitalism itself – will become green, is of uttermost importance. To study these agents and their practices, rather than choosing some green niche company, I chose a multinational player as a research site.[2] Underlying carbon accounting is the classification of emissions. To engage with this fundamental practice, this paper provides an analysis of three cases of classifying physical information within that company. Collecting 'physical information' is considered key to best practice in carbon accounting (Burritt, Schaltegger and Zvezdov, 2010). However, in contrast to Burritt et al., I argue physical information is not an innocent idea. By way of investigating the heterogeneous relations drawn on, strengthened and weakened in the course of classifying physical information, I show that critical scholars and other actors should better not trust black-boxed carbon 'facts'. We should be cautious about carbon information in three ways. First, even the simplest act of classification includes a qualitative element of betrayal. In the process of information being classified, some parts of the original set of information is disregarded and not made transparent. Second, turning attention to competing possibilities of how to classify a physical entity allows us to recognise the politics of boundary drawing and maintenance between categories. Third, if we zoom into a category and question the relations stabilising its inside we are confronted with ontological politics. This is a politics about what kind of carbon is constructed and, eventually, emitted into social and economic reality.

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1 This paper uses the word 'agent' to refer to the notion 'agents of ecological modernisation' which is developed elsewhere (Lippert 2010a; 2010b).

2 While I accept the view that any corporation could in principle green itself to some degree, this view does not address the issue of what happens within the most successful capitalist organisations when they engage with greening. Studying a large player seemed better suited to study those greening activities which were well compatible with capitalist economy at larger scale.

Some notes on underlying bodies of literature

The reconstruction of corporate carbon emissions has been influenced by these theoretical and methodological bodies of thought: firstly, Ecological Modernisation Theory (EMT), rationalising ecological modernisation, suggests that nation-states and corporations can become green through a greater, rather than a lesser, deployment of market-driven science, technology and expertise (Buttel, 2000). If indeed the rationalisation of the environment leads to the rationalisation of boundaries of markets, industry may then want to ecologically modernise by making 'environment' accountable (Christoff, 1996: 486). Howard-Grenville (2006) points to the significance of opening the black-box of corporate environmental practice. Often literature on EMT focused on grand social actors while having lost sight of the actual workers (pre)supposed to put the environment neatly into the accounting boxes. In line with Howard-Grenville's ethnographic approach to scrutinising actual members' practices and cultures, I consider a study of the classificatory practices (aimed at rationalising environment) to be a promising one.

Secondly, to inform my ethnography I have drawn upon Emerson, Fretz, and Shaw (1995) whose approach to structuring observation and analysing ethnographic field-notes is informed by Grounded Theory. My analysis amounted to about 300 pages, qualitatively coded using TAMS (Weinstein, 2006) following Emerson et al. (1995), and resulted in 1704 codes structured into 77 code families. This paper follows partial connections within the field – rather than posing my presentation as drawn from an omniscient god-like perspective. Analytically I have been informed by ANT, a theory which is sensitive to the relevance of non-human elements as constituent parts of social reality. Participant observation took place in a financial services company over 97 days during a period of 13 months. Research subjects were aware of my role as a researcher studying the culture, interactions and achievements of their everyday environmental management work.

Thirdly, according to Szerszynski and Urry (2010: 4), descriptions of climate change entail normative prescriptions about society. The tradition of Science and Technology Studies (STS) has been engaging with questions of climate change increasingly intensively (Shackley and Wynne, 1995; Lohmann, 2005; Lohmann, 2009b; Abramsky, 2009). Recent work by STS scholars and other social scientists on the economic instrument of carbon markets (MacKenzie, 2009a; Böhm and Dabhi, 2009) implied a need for empirical studies of carbon accounting (Lohmann, 2009a; MacKenzie, 2009b: 130; Lovell and MacKenzie, 2011) requiring investigation of the classification practices which underlie any accounting.

Thus, while EMT provides the framework of environmental politics within which this paper's subject matter performs, an ANT-inspired ethnography seems apt in order to scrutinise this particular set of practices presupposed by EMT: the correct classification of environmentally relevant consumption. By this we contribute to the social scientific discourse on the materiality and performativity of carbon economics. This text also speaks to those interested in performing realities through carbon emission construction. Those who normally black-box the question of how workers would actually bring about practices of ecological modernisation, may read this paper as a contribution which

questions their assumptions about the reality of corporate environmental monitoring. Similarly, it provides an alternative language with which to analyse environmental management practices.

Vantage point

To situate the vantage point of this paper, let us briefly consider carbon reports in the financial services sector. The Bank of America Environmental Progress Report 2010, for instance, claims that the corporation has reduced its carbon emissions by 18 per cent over the past five years. In 2010 an AXA website introducing their greening activities suggested that their Environmental Management System (EMS) was being put into practice with the help of a network of environmental managers. Many companies normally produce their reported carbon emissions within such an EMS. I visited one of the world's largest financial services providers to study their environmental managers. This paper is about those at the bottom, literally in the basement, who provided the numbers which were assembled to represent the corporation's carbon emissions. We will focus on a set of practices located there which fundamentally constrain how carbon emissions come into business existence: quantities of goods and services consumed were classified in accounts, and attached to these classifications were carbon conversion factors.[3]

This paper proceeds in the following manner: in the next section, I briefly introduce you to the sites of research, my access to it and the theoretical as well as methodological framing. Subsequently the main part of this paper consists of an introduction and analysis of three cases of classification practices. While reconstructing these practices my analysis also provides an introduction on a case-by-case basis of what I perceive to be the practices' complexity. Finally, I conclude by way of summarising the cases and point to their implications in terms of struggling for collective control over production.

Positions

In the following I provide a number of coordinates for the reader to be able to locate the author, the company and the cases discussed. To begin, I introduce the field site and my position within it. Subsequently, I turn to the relation of the company to carbon emissions and to the rationality of an Environmental Management System. This section ends by introducing the methodological and theoretical apparatus mobilised for this paper.

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3 The practices of the carbon accounting system discussed here may be significantly shaped by the fact that the financial services sector has not been addressed by the Kyoto Protocol as a polluter. Rather, the corporation participated in the Voluntary Carbon Market (VCM) to "neutralise" emissions. Under the European Union (EU) Emission Trading System (EU ETS) those polluters who are obliged to reduce their emissions are grasped through their installations. This paper does not investigate the environmental and carbon accounting systems of installations' operators. These may be structured very differently and, thus, may imply very different translation practices compared to the ones observed in this study.

Field site

The account of this story is based on ethnographic fieldwork in the heart of one of the world's largest corporate groups in the financial services sector. I shall call this corporate group *Global Finance Quality* (GFQ).[4] Equipped with gigantic resources, GFQ is linked to tens of thousands of customers in over 50 countries, having far more than 10,000 employees. GFQ reported these business key performance data in a late year of the first decade of the 21st century: turnover totalled over 120,000 million United States Dollars (USD), its profits summed up to more than 7,000 million USD and its assets met the 1,000,000 million USD mark easily.

My position

To gain access to GFQ, I had to engage contractually with their CSR unit as a low-paid worker. This access legitimised my presence in the corporation and allowed me to study GFQ's agents of ecological modernisation. The prime field site was GFQ's head quarters (HQ) which was located in a major city of one of the G8 states. I undertook further field work at the margins of the centre of carbon construction – on two continents - visiting some of the GFQ subsidiaries. The period of my empirical work paralleled the development of the global financial crisis of 2008 to 2009.

From the point of view of the corporation, my primary task was to help them out with a database which members used to collect environmental data. The database was designated *Environmental and Social Data Reporting* (ESDR); I will refer to it later in this paper. As a trained environmental manager with IT skills, I tested the software, co-ordinated its update and configured it according to users' wishes. Thus, acting as a white-collar worker, I interfaced between corporate environmental managers and the IT company which developed and maintained the database. Of course I also co-produced all the situations which I observed. When my boss, Victoria Miller, was introducing me to other corporate actors she would first of all explain my technical job and then say that I was also doing doctoral research on cultural aspects of environmental management. My double role was accepted. Towards the end of my fieldwork, superiors of GFQ asked me to continue working on the environmental database job. This can be understood as an indicator that my work performance was perceived as sufficiently native. Thus, we may assume that my position and observations from there fit well into the field.

GFQ's relation to carbon

The location from which my narrative sets out is the unit of the company that was concerned with sustainable development, corporate social responsibility and corporate citizenship. The mandate of the unit states that its aim was, according to Artefact 2.1 (an anonymised verbatim copy),

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4 The group's name, all data revealing its identity as well as all the names of members central to the study have been made anonymous.

> implementing the [GFQ] strategy for sustainable development by leveraging worldwide integration of environmental stewardship [...] into business practices.

Artefact 2.1: Mandate on Sustainable Development

Without going into the buzzwords of sustainable development, environmental stewardship and the idea that an organisation is capable of leveraging change on such a scale, I shall immediately turn to the key of this text.[5] GFQ used the language of carbon emissions to analyse the extent to which their sites were operating on a green basis. To shed light on the situation of the corporation vis-a-vis CO_2, quoting another document is useful: here is a presentation devised for showing in a nutshell why GFQ needs a programme to reduce its carbon footprint. The presentation was targeted at local environmental managers during their internal training, and included statements such as (an anonymised verbatim copy):

> [We] announced a voluntary reduction of [our] own CO_2 emissions until [2015] by [25%] (baseline [2006]) group wide with the following objectives:
>
> - Demonstrating [our] commitment to climate change mitigation
> - Securing the top position in ratings (DJSI, FTSE 4 Good, etc.): 20 - 30% of the rating weight derives from environmental area.

Artefact 2.2: Making the Case for Carbon Foot-printing

To put this into perspective one should also note that while top managers of the corporation considered carbon neutrality as an aim, the first bullet point sets the goal: carbon foot-printing was to be implemented in order to show that GFQ cares for climate change. Their commitment was demonstrated by quantitative reduction targets and corresponding emission measurements. For the latter, GFQ was employing measuring devices. This paper engages with these below. In advance, let us visit the economic context. The second bullet point referred to two indexes, the *Dow Jones Sustainability Index*, listing in its own words 'leading sustainability-driven companies worldwide' and a FTSE index, listing 'companies that meet globally recognised corporate responsibility standards'. While the first bullet point does not provide for any measurable target, the second does. Activities leading to higher scores in such rankings can be measures to improve environmental performance, decreasing the environmental footprint or environmental considerations in investments.

Why are these rankings and indexes of relevance? The multinational I studied is active in the financial services sector, is one of the biggest global actors in this sector and is regularly listed among the top 100 of CNNMoney.com's Fortune list. To keep its position the multinational aimed to attract investments of other investors. DJSI and other rankings provide banks with information about which corporations are green. These rankings construe companies as comparable. Both, private and public customers specifically invest into such green funds. Many such customers would try to invest in

5 For introductions to critiques of so-called sustainable development see Banerjee (2003) and for studies of the role of Environmental Management Systems in corporate practice see e.g. Boiral (2007).

packages which are both green and profitable. Thus, to attract such investments the multinational I worked for tried to show itself as high in the rankings as possible.

To reach a high rank an organisation has to show its environmental performance and its green trajectory. In order to demonstrate these credentials, a modern organisation takes a safe choice when using numbers as the language which indicates their greening reality (Latour 1987, Köhler 2010). My research focussed on those actors who were employed to produce such numbers by means of an Environmental Management System.

The presumed rationality of an EMS

An Environmental Management System (EMS) is an organisational structure which supposedly helps the organisation to move onto a trajectory of change towards incremental greening.[6] It can be considered an archetypical instrument of ecological modernisation (Buttel, 2000: 58). Its promise is the economic and transparent rendering of environmental effects of a business into a firm's rationality. Several schemes of EMS exist such as the International Standardisation Organisation (ISO)'s norm 14.001, or the EU Environmental Management and Audit Scheme (EMAS) as well as many national standards. Rationally managing environmental 'goods' and 'bads' presupposes, within the schemes' logic, quantitative knowledge of the state of environmental impacts. In order to gain this knowledge corporations have to create new information. At GFQ this new kind of information was based on consumption data.

The EMS-Team (i.e. the team co-ordinating the network of environmental managers and their greening activities at the level of the multinational) asked local environmental managers from globally distributed subsidiaries to submit information about the consumption of a variety of goods and services during an earlier year. These local agents had been asked to collect data on five so-called key performance indicators: how much water, energy and paper had been consumed at a subsidiary, how far they had travelled and how much waste they had produced. Local agents had then collected the data and submitted it by means of a centralised database called ESDR. Each year, HQ agents would ask local agents to submit such data and later on HQ based EMS-Team assistant Elise Richards would analyse the data, sum it up and produce so-called environmental balance sheets for each subsidiary as well as for the total corporate group, GFQ. These balance sheets provided the carbon emission figures which were then reportable to the public. When visiting one particular West Asian subsidiary my aim was to learn about how a local agent would gather the piecemeal data about the environment.

Methodological underpinnings

Before turning to these managers and their relations to data, let me outline the methodological approach which underlies this paper. The field is populated by a heterogeneous set of things, workers, texts, information and the complex relations between them. To ensure that this study does not make ontological assumptions rendering any of them a priori more significant than others, I tried to analytically

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6 Cf. Fineman (2000) vs. Rikhardson and Welford (1997) discussing greening businesses in general.

approach all of them at the same level. The method-sensibility actor-network theory (ANT) seems particularly well suited for this approach. Studying the set and its relations with this approach allows the question of ontology to be the central consideration of the study, rather than its starting point.

Here is how I enlist ANT. The approach is fundamentally based on the notion of translation (Law, 1992: 2). Callon (1999: 67) characterises this sociology of translation as studying 'the simultaneous production of knowledge and construction of a network of relationships in which social and natural entities mutually control who they are and what they want'. Thus, how power and agency is distributed among all kinds of entities was an open question (Callon and Latour, 1981: 280). Such a use of this kind of sociology follows actors' practices and investigates the ways in which they relate to other humans and non-humans. With ANT we may study how actors gain power. For example, Latour (1987: 71) likens a shop steward acting as a spokesperson for the workers on the floor with a scientific author presenting them self 'as if he or she were the mouthpiece of what is inscribed on the window of [an] instrument'. Both speak for other entities. ANT designates anything which is represented or acts as an actant. This allows one to treat all kinds of entities analytically and in symmetry. If a scientific article makes a certain statement, the latter can be treated as an *actant*. Thus, actants are not limited to those with material bodies but are often semiotic actants. If you zoom into such an actant, i.e. construct the actant analytically as a black-box which you are opening, you will find further actants inside which are somehow related to each other. Thus, ANT treats an actant as existing as 'a patterned network of heterogeneous relations, or an effect produced by such a network' (Law, 1992: 4). To gain more power an actant would have to speak for more entities, i.e. black-box them and take a seat on top of the box. If this spokes-entity successfully finds a position such that others need to speak with it in order to relate to what the spokes-entity represents, we may call this position an Obligatory Passage Point (OPP). Any kind of access to the matter behind the OPP passes through it (Callon, 1999). The actants behind this point are positioned 'backstage' (Law and Callon, 1992: 51). To bring about this configuration the actor on top of the black-box had to enlist those now backstage. This refers to the process in which entities are constructed as allies by an actor. The success of such an endeavour depends on whether the entities in question allow for such an enlistment or whether they dissent. An actor may increase her chance to enlist other entities by making them interested in being represented by her, i.e. construing a position of herself as spokesperson in the interest of the entities.

Drawing on this terminology we conceptualise, follow and describe in detail actants involved in classifying environmental data. Following Law (2007: 2), this approach cannot be expected to provide grand theoretical explanations. Rather, this paper may contribute to a re-conceptualisation of the relations and ethics underlying carbon business.

Epistemologically, this approach entails social constructivism. However, even though all knowledge is assumed to be socially constructed, the real exists. Most social constructions are dependent on reality to materially carry the construction. Thus, all knowledge is constrained and enabled by those bodily material actors which it refers to and which produce it (Haraway, 1991). To follow how humans, texts and material

interact, methodologically, then, the paper is based on participant observations and an analysis of artefacts encountered in the field. Using these methods seemed apt because they allowed analysis of the ways observer and observed were materially situated. The quality of the analysis has been documented according to Flick (2007: 134-136). The field note extracts and artefacts presented in the following section have been identified in a process of iterative coding and thematic focusing (Emerson et al., 1995). One of the resulting foci represented practices of classifications. This paper analyses three contrasting cases of classification identified with this method.

Classifying consumption – creating carbon?

This section serves to present the analysis of three cases of classifying consumption. The first case, concerning the classification of electricity consumption, can be read as what is normally taken-for-granted: neither did members question its classification nor did any actants dissent. The second case opens up a range of modes to classify a package of paper. Finally, the case of water consumption makes explicit how the choice and design of a class is related to carbon emissions.

My boss, Victoria, had asked a West Asian subsidiary to welcome me in order to support my study as well as to ensure their participation in the data collection process which was key to the EMS. When I arrived at the site of the subsidiary, I met Simon Jacobs. He had been the addressee of my boss's request to have them welcome me. Simon was one of the top officers of this subsidiary, occupying a large office, with a glossy wooden desk and several square meters of windows at the top of the building.

Early in our meeting Nick Xi joined us and presented a list of numbers to Simon. Later on I learned that Simon had asked Nick, who was the site's engineer, to collect the environmental data which the HQ had asked for. Subsequently, Nick showed me around at the site, and, finally, we went to his office, located in the building's basement.

Electricity: a clear-cut case

In the windowless room I recognised six work places. Nick's beige desk was equipped with two land line telephones, a computer screen, mouse and keyboard and an opened guideline issued by the HQ prescribing the parameters of GFQ's environmental data reporting. Some of the words were neighboured by scribbled translations into Nick's native language. The wall behind his red chair was supporting (or supported by?) a picture of the national leader. He offered tea and I asked where he got the numbers from that he had earlier presented to his boss. As a response he got out a file folder. Opening the folder, Nick presented its content:

> Electricity invoices of 2008 and 2009. He pointed out that the invoices include the amount of kilowatt-hour (kWh) consumed by highlighting the data. Thus, he had seen the numbers, not only calculated.
>
> **Field Note Extract 3.a (Measuring electricity consumption)**

This presentation of electricity supply invoices indicates several key elements, which we need to keep in mind to fully understand their social and environmental

implications. This subsidiary consumed electricity for which it had to pay. An invoice listed the amount of consumption for which the subsidiary was charged. By showing the invoices Nick pointed out that he relied on measured data of the consumption, rather than on a more abstract calculation. Within GFQ it mattered whether data was designated as 'measured', rather than 'calculated'. The Head Quarters' EMS-Team was observing – what they called – 'data quality'. They considered measured data to be of higher quality than calculated data. The guideline, supposed to orient Nick, included a hierarchical order of data qualities (see Artefact 3.1, a verbatim copy):

> Level of data quality:
>
> 3 = Data based on exact measurement
>
> 2 = Data based on calculation / detailed estimate
>
> 1 = Data based on rough estimate
>
> 0 = Data not reported

Artefact 3.1: Data Quality

Furthermore, note that Nick's highlighted data represented those kWh consumed which had been billed. Thus, the measurement has neither been carried out nor observed by Nick.

Drawing on ANT, we are able to unpack the relations involved in this moment in even more depth. The extract above provides us with a range of diverse actants having largely contrasting qualities. Let us visualise them in Figure 1:[7]

First, we encountered Simon who acted as the environmental manager of the subsidiary. His task was to report environmental data to the HQ, represented by Victoria. To do this he had asked Nick – an engineer – to collect the respective data. Thus, Nick started to check where he may get the data from. He found data in invoices and provided selected information of these to Simon. To legitimise the numbers presented to Simon, Nick pointed to the 'facts' shown on the monthly invoices. Following Latour (1987: 23), a so-called fact is something which does not invite to question 'ownership, construction, time and place'. Further, he suggests: 'A sentence may be made more of a fact or more of an artefact depending on how it is inserted into other sentences. By itself a given sentence is neither a fact nor a fiction; it is made so by others, later on.' (*ibid.*: 25) In the case we are exploring Nick had enlisted the authority of the invoices to speak for the consumption of electrical energy. By that he gave more weight to an element of the electricity provider's statement while deleting contextual information from the facts, which enacted a dichotomy of content and context. Nick quoted the class, quantities and the units – but did not refer to the author of the consumption counts nor did he investigate how these counts were constructed. The invoices, thus, were a carrier of a

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7 Note, this figure – as well as those below – indicates actants through the colour orange, a description of their relation in green. Actants which I have not directly observed are shown in violet, their relations into the field under study is represented in grey boxes. A rounded rectangular depicts human actors and organisations. I use octagons to point to (digital) materials and ellipses to informational actants.

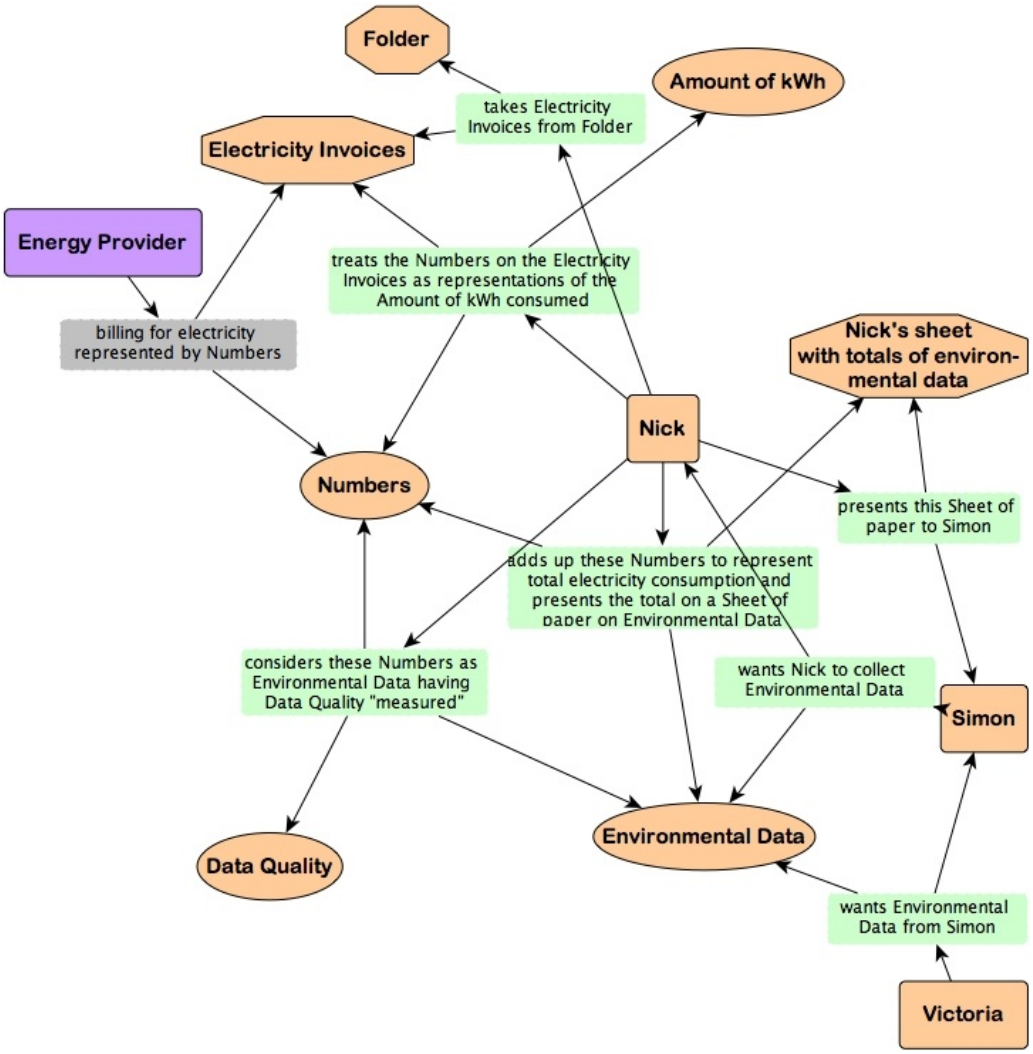

Figure 1: Using amount of electricity billed for to speak for environmental effects

range of information, some of which was translated to the sheet which Nick had used to present the number to his boss. Latour conceptualises the context of a statement as its modality (1987: 22). A modality is a qualifying and, by that, modifying statement associated to the former statement. Another take on Nick's act of demodalising is to understand it as a form of purification (Latour 1993). The invoices' offers of text were processed by Nick, first purifying its information, resulting for each invoice in a single number, its unit (kWh) and class (electricity consumption generated by hydropower), adding the numbers up and copying this to Nick's sheet which he used to collect the environmental data. The effect of purification is that traces of the hybridity (in this case e.g.: authorship, materiality, historical position and economic relation between provider and customer) of the entity in question are silenced. (Note, GFQ was asking data collectors, i.e. Nick in this case, to assign any numbers reported a single value for data quality. Thus, later he continued altering the modality of the statement by assigning to the single number the data quality signifier 'measured', and by that informing the HQ that the number has been read off a measuring device.)

Drawing on Latour (1987: 109-121), this set of relations performed by Nick can be understood as translation. By using a single number to represent the electricity consumption Nick created a fact which all other actants had to use. No actor attached to GFQ's EMS who had knowledge about this subsidiary's electricity consumption as a goal would look again at the invoices or look out for alternative facts. Nick's translation to the sheet made his fact indispensable. He became the macro-actor on top of the black-box called electricity consumption (Callon and Latour, 1981: 284). The implication is not politically innocent. Any translation is rendering two statements equivalent and, thus, shifts the meaning. (This, of course, includes the translations undertaken by the author of this text.) Law (2007: 4), therefore, points out that translation also implies a dimension of betrayal. According to this then, analytically, Nick and the electricity consumption number can be understood as allies. He allowed the energy provider's statements to circulate even further in the world and attached his power to translate the invoices into a single number. And the invoices allowed him to translate some of their elements such that he could consider his job done.

How did this 'information' gain the possibility to travel? Latour (1987: 68) uses the concept of inscription to rethink the material fundamental for the mobility of information. The energy provider inscribed selected information into the invoices sent to the subsidiary. An invoice, thus, can be understood as the 'visual display' of the electricity consumption. Latour refers to anything or any institution which provides such displays as inscription devices. Nick inscribed the electricity consumption number onto a sheet of paper, thus performing a further inscription device. Or, seen the other way around, Nick's environmental data sheet transformed – as Law (2004: 20) points out – the material, i.e. here the invoice's information is transformed into a purified form which was more apt to usage for the worker. The effect was simple enough: only traces of the originally rich invoices were left for the next level of translation. Most information of the invoices was deleted by Nick's application of this specific inscription device. The associated implicit claim was that the product of the translation represents the reality of the subsidiary's electricity consumption. Latour (1987) points to two further competencies of a statement which would strengthen it: combinability and stability. The invoices' numbers were easily combinable by Nick; he had to perform the mathematical operation called addition. At the same time, these numbers were stable. Neither was there a reason to question them, nor did they seem prone to erroneous copying.

This discussion showed that the simple administrative practice of adding up numbers provided by invoices, in order to represent the total amount of kWh billed for, has to be understood as consisting of constitutive and emerging relations giving rise to a specific configuration of power: among these was Nick gaining the power to construct, a fact which was not questioned in itself by anymore. To be more precise: the fact has not been altered during my field work and I see no reason why it should be; except, maybe, if this analysis shifts light to its conditions of existence. This analysis shows that even the simplest case of classifying physical information is intrinsically problematic: to achieve the classification act, a worker has to betray all the 'Other' which was entangled with the 'physical'. Demodalising is necessary for accounting and is not normatively neutral.

While this first case did not question the class onto which the kWh consumed were to be mapped, let us now look into Nick's practices and the relations he co-performed when they had to deal with the question of what type of environmental data some numbers are related to.

Paper: classification contested

Another type of environmental data which GFQ was interested in was the amount and type of paper consumed. When Simon and Nick sat together and I introduced them to the database which GFQ used to collect environmental data, paper was the example to understand the database's functionality.

> Simon was logging in into ESDR and I showed them how ESDR tasks work by pointing to different categories of paper.[8] Simon was getting up and fetched a 500 page package. He asked: what paper is it? And he looked at the labels but could not find much information. Then Simon suggested to looking at the producer's website. After a short while, Nick claimed it to be recycled paper. Simon replied: no. This isn't recycled paper. We will recycle it. Finally, Nick agreed.
>
> **Field Note Extract 3.b (Paper Case)**

Let me use this extract to emphasise a key assumption in the field: using paper, just like electricity, causes carbon emissions – depicted in Figure 2 on the next page. However, paper does not necessarily equal paper. Different production processes and kinds of disposal are associated with different emissions. GFQ, thus, differentiated several types of paper, e.g. chlorine-bleached and recycled paper. Simon and Nick undertook an act of classifying the paper they normally used. For that, Simon briefly went to his secretary, getting a package of paper. This material object had not been assessed by them based on some form of scientific/laboratory analysis, but rather, they questioned the object in two senses. Latour (1987: 89) suggested that in science in action things are 'defined by their performances [where] each performance presupposes a competence' (quoted without emphases). In our case the paper package's performance was questioned with respect to globally and temporally distributed competencies. First, Simon asked the object's label to reveal its class, and when that failed, he suggested retrieving the required information from the producer's website. Second, Nick enquired into the near future of the object and found that it will be recycled.[9] While Nick concluded thus, that the object has to be classified as recycled paper, Simon opposed Nick's understanding. Thus, temporarily Simon and Nick were allies to competing claims. This needed to be resolved? Rather than using the object's future as the indicator of its class, Simon implied, we should categorise the object based on its past. None of the two competing claims can be considered intrinsically right. Instead, drawing on MacKenzie (2009b: 26-30), we may conceptualise categorisation through finitism. A finitist take allows focus on the factors constraining the in-principle flexibility of classification-in-the-making. In this case, the constraining factor may be interpreted as the combination of formal authority of Simon in relation to Nick and the recognition of Simon's better understanding of English language. In both respects, Simon was able to exhibit control because he related closer than Nick to the sources of

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8 An "ESDR task" refers to a form in the database. See the subsequent section on the water case.

9 A note for the Northern/Western reader: In this particular situation it was not self-evident what the English term 'recycled paper' conventionally refers to.

formal authority within the company and to the language in question. Thus, they moved on to enquire backwards in time. As they did not find any hint of the paper having been pro duced using recycled materials, they finally concluded the act of classification by deciding for the class 'new fibres elementary chlorine bleached'.

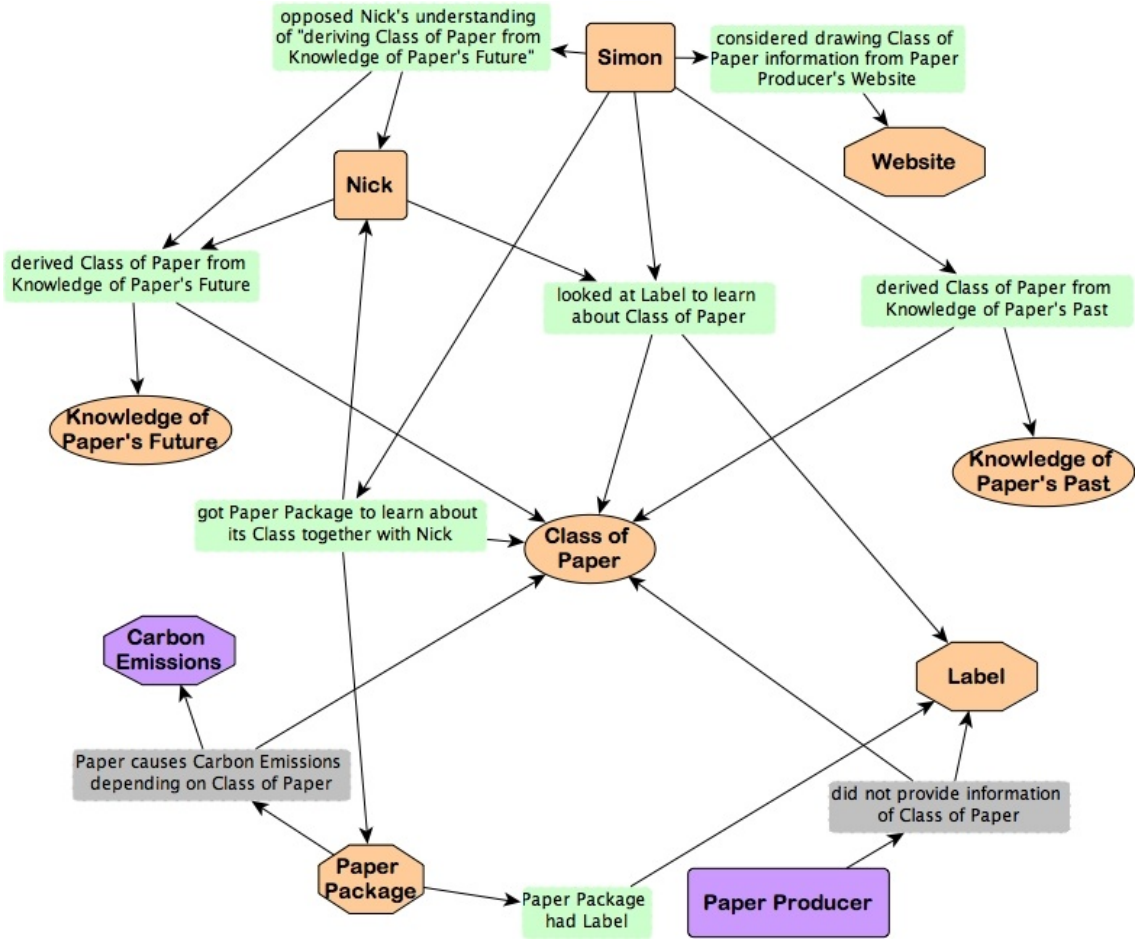

Figure 2: Establishing the Class of a Package of Paper

Yet, another effect of their interaction is that which we may call enculturation. With Latour (1987: 201) we are able to think of disputes over classification claims as signifying the boundaries of a culture: '"culture" is the set of elements that appear to be tied together when, and only when, we try to deny a claim or to shake an association'. In our case, Simon performed a 'boundary' of a culture offering Nick to join. The former tied together the term recycled paper to a temporal view, i.e. determining whether a given paper object is recycled paper through its past. Under the circumstances of capitalist work-relations, Nick probably did not see much of a choice as to whether to accept his superior's offer. In this new culture for Nick it is possible to be green by means of switching from chlorine bleached paper to recycled paper. Porter (1995: 42-45) points to the significance of such effects. An account category may transform business practices such that the company performs well in this new dimension.

Having made explicit the actants and their relations involved in this case allows us to recognise the political quality a) of the boundaries between categories, b) of the

epistemological uncertainty as well as c) of the cultural stabilisation associated with classifying the 'physical'. Figure 2 indicates a further aspect of the social practices of constructing carbon emissions. It depicts how the conversation between Nick and Simon is related to carbon emissions. The classification of the paper they use is linked to the carbon emissions which they were about to construct as being caused by their paper usage.

In the next case we focus on the mode of existence of carbon emissions. Above, we learned that to file an object it needed to be classified first. This implied giving voice to one modality while black-boxing alternative modalities. We also saw that boundaries between categories needed to be actively performed to matter. It remains to discuss what happens if the available system of classification fails. This discussion will open a view onto the hinterland (Law, 2004: 27) of classification implications.

Water: how a category silences matter

When Nick approached filing water consumption, he diligently gathered data from different sources of water consumption, including a well, tap water, and, a huge amount of drinking water. However, then I had to interrupt his endeavour:

> 15:50: I told Nick that Elise was saying that drinking water is tap water. Nick asked: What shall I do? I replied: I can only inform you. I cannot decide. You have to decide. I told Nick that the HQ does not need the drinking water data that he had collected. But, I suggested, he could collect the data for his subsidiary.
>
> Then Nick was calling the canteen and cafeteria to ask how much drinking water they use. He added this information in the ESDR task [see Artefact 3.3].

Field Note Extract 3.c (Water)

This situation was backgrounded by GFQ using the database ESDR to collect environmental data from all over the globe. Members of the EMS team administered the database. Nick, as a local agent, put data into the database – by means of a form referred to as 'task' (see Artefact 3.3). At the HQ, superior (in terms of the organisational hierarchy) team members were able to access the data. I had stayed in close email contact with Elise (one of the HQ colleagues) in order to ensure the data which Nick constructed during my visit fitted the EMS's requirements. This is how the story unfolded: at 14:50 I had sent her an email differentiating the consumption of water according to different types of sources (a well, bottled water, tap water). At 15:01 she replied and dealt with the different classes of water. Her email provided, firstly, a quote from my original email to her, and secondly, an answer (a verbatim, anonymised extract):

> [My text:] They are having a) a well (natural water), b) drinking water (in large cans – in heaps), c) tap water. What is tap water – which account are we supposed to use?
>
> [Her reply:] Drinking water in cans is not included into the calculation, merely the water got from taps ([use the account] drinking water). Well water is natural water. This account is correct.

Artefact 3.2: Email at 15:01: Drinking Water defined

Key to understanding this email is first of all recognising the means which Elise and I draw on: accounts. ESDR can be understood as an effect of an accounting culture. Within this, 'environment' was managed through an accounting system which associates each consumption data set to an account. Such an account was characterised through an 'explanation', drawing out, i.e. defining, the class (see lower part of Artefact 3.3). Elise, interpreting the definition, thus, specified that water received by means of a system of pipes, rather than by means of transportable cans, had to be filed in the account 'drinking water'. Water received through cans was to be excluded. Yet, after I informed Nick at 15:50 about Elise's filing prescription, he decided to collect the data on bottled water anyway. Thus, this underlines that any definition needs to be actually translated into the intended practice to produce the targeted effect.

Task Owner	[redacted]		
Period	2008		

REPORTED DATA

Value	426	Unit (value)	m3
Cost	35137	Unit (cost)	[redacted]
Energy / CO2 Factor	World average		
Comment	[redacted] and [redacted] office use 154 m3 drink water.(800 employees)I calculated 1299 employeees drink water and price.I add them.Dining hall and cafeteria are outsource company.(Use drinking water with bottle 171 m3.)		
Data Quality	1 = estimated	This Dataset is finished	yes

DATA COLLECTION BY MAIL + CLOSE | EDIT | CLOSE

REVIEW (Updated on Save)

	Last Period	Current Period	Deviation
Value	0,0 (not available)	426,0 m3	0,0 %
Reference Account		0,3	0,0 %
Cost	0,0	24.128,4 EUR-Euro	

Explanation

Drinking water: purified water with drinking quality, withdrawn from groundwater, water sources or surface water
water consumption includes water use for:
- sanitary installations
- air conditioning
- cooling systems
- cafeteria, garages, sporting areas
- indoor plants
- external areas, e.g. parks

The use of water for cooling or heating purposes where it is led back to its source without treatment is not water consumption as defined in this section.

Last modified	27.03.2009 14:13:21 [redacted]

Artefact 3.3: ESDR Task for Water Consumption

Furthermore, an account was specified by logical and quantitative criteria, including its carbon conversion factors. Let us briefly focus upon this fragment of the network. The respective factor stored in ESDR for the drinking water account was 0.3747kg of so-called scope-3-emissions for each consumed cubic metre. This refers to indirect emissions caused in the life cycle of a product. GFQ sourced this number from the

voluntary industry specific environmental reporting standard called Standard of the *Verein für Umweltmanagement in Banken, Sparkassen und Versicherungen* (VfU). This is a standard organised by several large international banks and insurance companies and is freely available to everybody. Study of this document shows that the number generated is the sum of two factors 0.283 and 0.0917. The former factor is presented as being derived from the emissions associated with waste water treatment in Switzerland and the latter factor with the production of drinking water. Further, the document refers to two sources, 'Althaus (2003)' and 'Doka Gabor (2003)'. The latter presents himself as a Life Cycle Assessment (LCA) practitioner based in Switzerland and provides a variety of statements on ethics, including this one – which contains a comment on epistemology (a verbatim extract from http://doka.ch/ethics.htm, last accessed 17/10/2011):

> Contrary to popular belief an LCA study is never objective or provable. Subjectivity occurs in all phases of an LCA study. In that struggle I always take the side of the environment. With precaution I strive to make sure potential burdens are not lost from view.

Artefact 3.4: Fragment of the Ethics Statement on Fairness

We need to note that while carbon emissions assigned to drinking water production and sewage treatment are included, the covering of the multiple additional emissions of bottled water is uncertain (and must remain for now an open question).[10]

When mapping this water case, in Figure 3 on the next page, note the contested area. The highlighted (dashed black-boxes) relations were those performances which were giving the ultimate shape to what water consumptions were filed in the database, ESDR.

This shape exists now as carbon matter in social and economic reality, which may be linked to environmental reality 'outside'. Law (2008: 10-14) refers to practices which perform such shapes as *mattering*, enacting matter. The reality perceived is shaped by effects of performances of 'mattering'. Struggles over the real are inherently political. Thus, these practices are performances of ontological politics.

By my act in the field of asking Nick to decide about the inclusion of bottled water I tried to prevent too early a closure of the dispute. Rethinking this moment with MacKenzie's approach to finitism allows for seeing a view of how an implicit decision necessary to carry out the act of classifying has gained the possibility to play itself out more explicitly. Thus, in Artefact 3.3 Nick hinted in a 'Comment' that he added 171 cubic metre of bottled water in the account. Thus, the 64 kg CO_2e emissions assigned to this water (however, maybe not those to the bottles) were, eventually, included in GFQ's carbon emissions count. In that respect, Nick acted as a dissident as formulated by Callon (1999). Nick did not let himself, and through that the product of his translation (the reported amount of water consumption), become enrolled by Elise; a betrayal took place – and I was an accomplice. Elise's act of purification was not completely successful. While she had the formal authority within the organisational

10 The emissions were in multiple ways additional because, first, Elise asked to exclude water from cans and, thus, emissions associated with this water. Second, this exclusion also leads to not accounting for the emissions caused by the synthetic cans.

structure of the EMS to interpret the definition provided in the form and to inscribe its application in a directive email to me, the relations involved did not lead to the prescribed effect. And, now, one might ask who or what was betrayed? Several actants are thinkable – among them the imaginary actant of GFQ or so-called nature. Analytically seen, the network of Nick, his data sources represented in various inscription devices, ESDR, me and our collective performance constituted an OPP. Any water consumption fact of this subsidiary had to pass through the classification and translation filters of this network. However, from the point of view of HQ actants this network would normally only be perceived in a punctualised form. This resembles the punctualisation referred to by Law (1992: 5) who suggests that normally a TV is perceived in a punctualised form; the network producing the TV effect remains behind the stage.

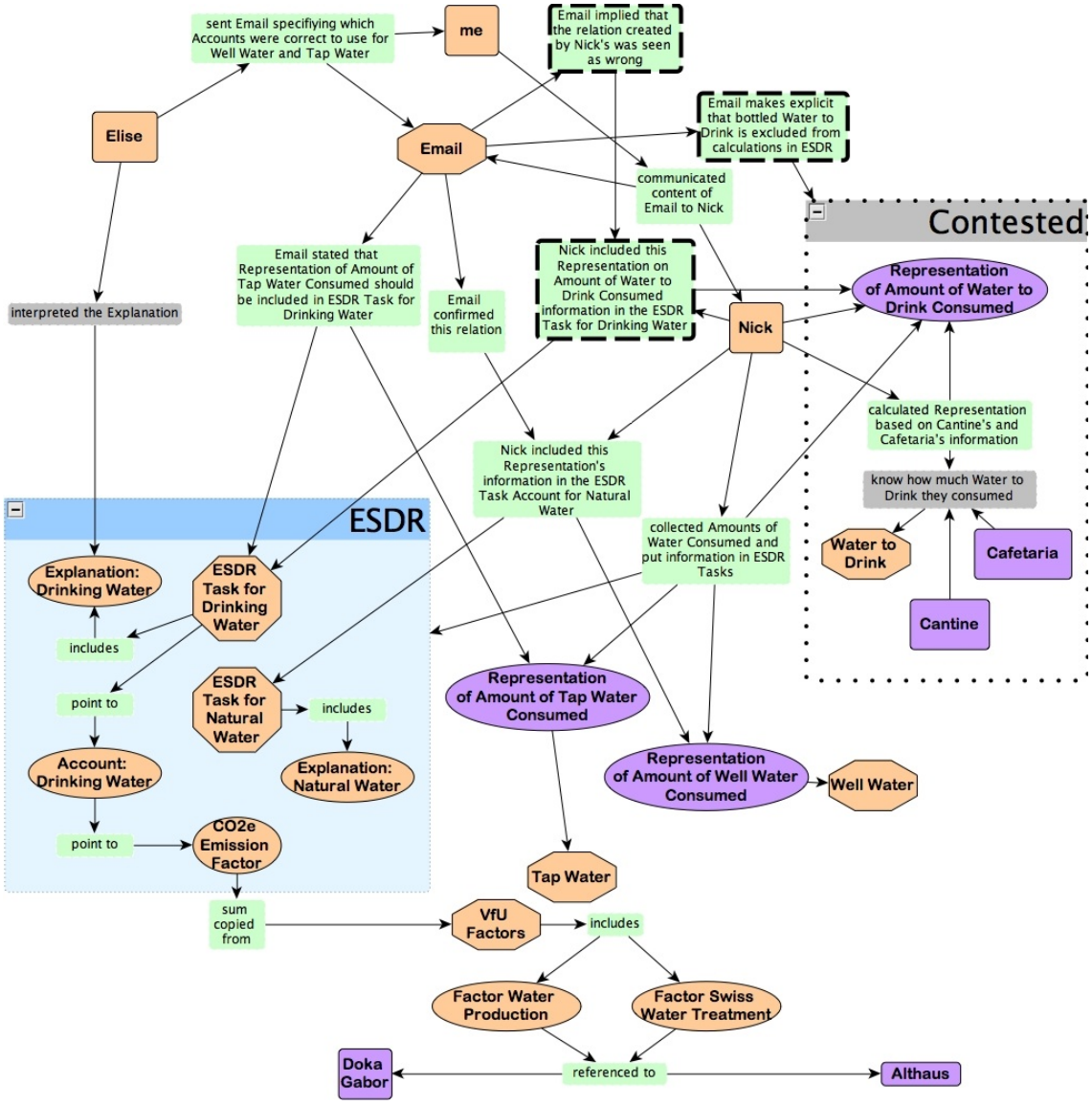

Figure 3: Establishing the Right Choice of Accounts to File Water Consumption

In Figure 3, above, we are more specific than in the prior figures: What we previously referred to as 'Environmental Data' we are now detailing as 'ESDR tasks' which constitute the form in which the data was contained. ESDR was a significant part of the machinery in constructing carbon emissions.[11] The accounts were linked to conversion factors which were used to calculate the amount of carbon emissions for the amount of water consumed. These conversion factors, as in the case of the paper (Figure 2), were often specific for each class of material consumed, i.e. in this case differentiated for three types of water. The statements produced by the Swiss LCA practitioner Doka Gabor had been enrolled by an enterprise which was in charge of producing the nitty-gritty for the VfU standard. Thus, this case followed the chain of translations further than the prior cases and, in this course, came across an exciting modality of ethics, which has been completely neglected in the public statements of GFQ and similar companies.

And, we may recognise in this case, similar to the case depicted in Figure 2, that culture – as introduced drawing on Latour above – is key to certain understandings which are drawn on in the practices of translating. At this time it was significant that in this culture, materialised in its infrastructure, water to be drunk was normally not obtained through a system of pipes, i.e. tap water, but through bottles and cans. This understanding was not shared between Elise and Nick. Their approaches to how elements were to be associated with the term 'drinking water' exhibited a discrepancy.

To carry the analysis a final step further, I like to point to the agency of Artefact 3.3. The local environmental manager's job was, ultimately, to produce and provide figures that can be inserted into this form. And this form asked for a number to quantify the good/service consumed and its unit; further, it allowed to relate costs and a comment to this data set. If Nick was to provide the data such that it fits this form, he needed to strip off all kinds of modalities from the numbers which he extracted by means of purifying the information he had access to. Not only were documents reduced to a couple of figures but so were a range of alternative interpretations silenced. In GFQ, water bottles did not matter; and nor did any deliberation about water use practices.

Conclusion

This paper aimed to show how classificatory practices giving rise to corporate carbon emissions are performed. These practices were concerned with classifying consumption of goods and services into accounts of an environmental reporting database. Following the relations revolving around such practices by a local environmental manager of a globally operating financial service provider allowed us to grasp the load of relations needed, reproduced and – to a large degree – silenced.

For that we investigated three cases. In the electricity case we problematised the *translations* which are part of all described performances of classification. We can now see that physical information is not a given but has to be generated. In the course of translating information into physical information, betrayal takes place. The corporation

11 For a more detailed discussion of the notion of machine, see Lippert (2011).

was not interested in giving a full account of their relationships with the material and services they consumed. Rather, and this can be assumed to be generally the case, carbon accounting is premised upon the reduction of selected parts of the world to a few numbers, quantities and qualifiers. Everything – the Other – which does not end up in the 'physical' is left out of the carbon report.

The paper consumption case added further layers to the problematisation of classificatory practices. Beyond the silencing of alternative modalities, we encountered the conceptualisation of boundaries between categories as a site of political contestation. A variety of meanings can be linked to boundaries. There is no intrinsically correct way of classifying the 'physical' into a proper category. While members may experience this reality as epistemological uncertainty, we also recognise that boundaries would not exist if they were not performed. In the case observed we see how the classification practices interfere with enculturation into wider discourses of greening and the performance of hierarchical work-relations.

By means of opening the black box of carbon conversion factors, the water case allowed a voice to be given to the *matter* which was silenced by the specific configuration of a category. The environmental consumption accounts within the corporation were linked to carbon conversion factors. Only those (assumed) realities represented by these factors were translated into matter. Those carbon emissions which were not envisioned by the constructor of the emission factors and by the standard, which the corporation used, did not materialise.

With both latter cases we may agree with MacKenzie (2009b: 120) expecting that 'the most detailed rulebook will on its own be insufficient to determine the practice of bookkeeping and accounting'. The practices observed gave rise to new facts about the carbon pollutions of the multinational. These facts still perform – and can be expected to continue performing – as part of the corporation's emission history tables. Furthermore, even for those partial realities 'well' governed by the rules and regulations about carbon accounting, we have to accept that the resulting carbon is intrinsically political. As the first case showed, even if all agreed that a classification act was performed perfectly all-right, quantitative accounting silences the modalities of facts and betrays all the information considered not 'physical'.

Yet, while the local acts of classification enabled the global counting of carbon emissions it also provided a locus for subversion. Quantifiable consumption information could be summed up. In that respect the combinability of quantitative facts provides for possibilities to add numbers quite freely. In this study we observed a local agent being able to increase the count of water consumed. As Law (2008: 11) suggested: '[I]f we attend to [practices consistently], then we start to discover alternative forms of materialisation'. This paper points to such alternative forms and, subsequently, competing ontological outcomes of materialising carbon. Thus, the engineer was not only drawing on and embedded in heterogeneous relations. The study showed how he was also doing 'ontological politics' by the practice of mattering consumption data into carbon emissions where alternative ways of mattering resulted in different ontological states of carbon emissions of the multinational. Engaging with this

kind of politics can be producing mappings similar to the ones provided above and involve adding further actants and shaping relations.

Another global effect co-produced by these local practices is the strengthening of specific carbon conversion factors. Each classification which assigns consumption data to accounts of the corporate database strengthens the associated carbon conversion factor. A quantum added to an account implied the translation of the carbon factor once again, thus, propelling the agency of the factor to global scales.

We also found that the global reporting mechanism of the multinational required local agents to perform in that moment and at that place a dichotomy of content and context. They had the task to filter, purify, the information at the local level and only translate those bits of information which fit in the form. At the same time some informational entities which could have fitted in the form were not always exactly those which were desired to be recorded in the form. Agents had to interpret the classes of the accounts, ascribing meanings to what kind of entities an account asked for and what kind of entities they knew. The corporation's global carbon monitoring system provided labels for the accounts; and these labels may introduce new or strengthen/weaken existing local concepts. While Howard-Grenville (2006: 68) shows that multiple interpretations on environmental issues may co-exist in an organisation, this paper questions the ethics of the existence of such a multiplicity, how it is silenced and how only limited interpretations are translated, to end up in a highly condensed statement of a company construing their carbon emissions. We saw how the very process of bringing in consumption representations as environmental data created both 'insides' and 'outsides' (Lohman, 2009a: 502). Performing classification co-constructed global carbon emissions (in so far as they are perceivable through carbon reports). To put this into perspective, note that these emissions are designed to figure as economic agents. They are created to steer corporate decision making, they may be read as demands for buying carbon emission rights on carbon markets. If betrayals are necessarily involved in the processes of translating towards the network effect of 'carbon emissions', the affected should have a chance to voice their perspectives or to have them voiced. Such levels of analysis and interpretation are missing from the analysis of Burritt et al. (2010). A reason for that might be that interviewing agents of ecological modernisation does not suffice to scrutinise the *practices* presupposed by Ecological Modernisation Theory (EMT). Insofar as EMT or CSR and sustainability discourses claim that capitalism can be greened, they miss out the nitty-gritty reality of how environmental reality is brought into social and economic existence. Organisation scholars encountering carbon 'facts' need to address the politics entangled with the production of this kind of information.

Claims about transparent communication between publics and organisations need to be interpreted as very restricted if the organisational machinery does not allow multiple interpretations to be articulated and developed. Automatising the provision of accounts of environmental impact is, in that respect, counterproductive vis-à-vis a careful, situated interpretation and reaction to multiple socio-techno-natural relations. This is especially relevant with respect to Abramsky (2009: 7) arguing for emancipatory and collective control of the means of production. Situated strategies for changing the running of production need – within such local decision-making – to question the processes of accounting for 'environments'. This implies investigating the ethics, e.g.

voices silenced or inscribed materiality in the means of production (such as in databases which reduce 'environment' within the production process to neat boxes in user interfaces). A question arising from this paper, then, is how agents of ecological modernisation can engage with the complexities encountered and how they can contribute to collective control over the alternatives of mattering environment within production. Further research should also reconsider how ontological complexity relates to the conditions for ideal speech situations postulated by Habermas (1991). Maybe carbon realities cannot be ethically correctly addressed by multinationals and their regulators. Going beyond the standard suggestions of putting the responsibility to engage with these complexities onto the shoulders of individualised actors (like environmental managers, auditors or enlightened citizens) might involve re-engineering the economy and materiality of production processes towards decreasing their complexity. To conclude, I would like to stress the minimal political consequence of this paper: ontological engineering of carbon emissions ought not to be a classified issue.

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